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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/511,874 | 10/18/2004 | Joachim G. Wunning | 230488 | 6514 |

23460 7590 07/26/2005

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| EXAMINER | |
|---|---|
| KIM, TAE JUN | |
| **ART UNIT** | **PAPER NUMBER** |
| 3746 | |

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/511,874 | WUNNING ET AL. | |
| | Examiner | Art Unit | |
| | Ted Kim | 3746 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *15-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

1. The amendment filed 10/18/2004 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: in claim 16, the range of less than twice a mass flow rate of the fresh air has not been previously disclosed.

Applicant is required to cancel the new matter in the reply to this Office Action.

### *Claim Objections*

2. Claim 25 is objected to because of the following informalities: the turbulence center lies on a curved surface is not idiomatically clear. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 15, 17-23, 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Wunning (5,154,599). Wunning teach a combustion chamber [for a gas turbine is intended use] comprising: a wall 20 enclosing an internal space for serving as a reaction space; an inlet 4 leading into the internal space that is supplied with fresh air; an outlet 10 emerging from the internal space for discharging hot exhaust gases; the inlet and the outlet being aligned and the internal space configured such that a relatively large circulating gas stream flow is formed in the internal space so as to maintain a flameless oxidation process; and a fuel feed device 7 arranged to guide fuel into the internal space in a predetermined direction, the fuel feed device and the inlet having essentially the same orientation; wherein the cross sectional configurations of the inlet and outlet the geometry of the internal space are designed such that the gas stream circulating in the internal space has a mass flow rate is larger than twice a mass flow rate of the fresh air introduced into the inlet (col. 6, lines 8-19); wherein the inlet includes a plurality of air nozzles 4 having a corresponding orientation arranged next to each other in a row; wherein each air nozzle has a portion extending beyond the wall; wherein the combustion chamber has a cylindrical configuration and the air nozzles are arranged on a circle that is arranged concentric to combustion chamber; wherein the combustion chamber is designed as a circular ring; wherein the inlet and the outlet are arranged and the geometry of the internal space is configured such that the circulating gas stream flow encompasses the entire internal space; wherein the combustion chamber includes a preheating device 27 or 8.

5. Claims 15, 18-23, 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Domschke et al (6,234,092). Domschke et al teach a combustion chamber [for a gas turbine is intended use] comprising: a wall 17 enclosing an internal space for serving as a reaction space; an inlet 14 (see col. 5, lines 49+) leading into the internal space that is supplied with fresh air (col. 6, lines 14+); an outlet (not shown but inherent) emerging from the internal space for discharging hot exhaust gases; the inlet and the outlet being aligned and the internal space configured such that a relatively large circulating gas stream flow is formed in the internal space so as to maintain a flameless oxidation process (col. 5, lines 49+); and a fuel feed device 16 or 15 (note that the "incombustible liquid" 15 may have combustible components, and is thus a fuel with low heating value, see col. 4, lines 51+; col. 6, circa line 54) arranged to guide fuel into the internal space in a predetermined direction, the fuel feed device and the inlet having essentially the same orientation; wherein the inlet includes a plurality of air nozzles 14 having a corresponding orientation arranged next to each other in a row; wherein each air nozzle has a portion extending beyond the wall; wherein the combustion chamber has a cylindrical configuration and the air nozzles are arranged on a circle that is arranged concentric to combustion chamber; wherein the combustion chamber is designed as a circular ring; wherein the combustion chamber includes a preheating device (can be read on 13).

6. Claims 15, 18-22, 24-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Seymour (5,727,378). Seymour teaches a combustion chamber for a gas turbine

comprising: a wall enclosing an internal space for serving as a reaction space; an inlet 108 and also including 120A (see Fig. 4) leading into the internal space that is supplied with fresh air; an outlet emerging from the internal space for discharging hot exhaust gases; the inlet and the outlet being aligned and the internal space configured such that a relatively large circulating gas stream flow A, 146 is formed in the internal space so as to maintain a flameless oxidation process (see col. 15, lines 16+); and a fuel feed device 64 arranged to guide fuel into the internal space in a predetermined direction, the fuel feed device and the inlet having essentially the same orientation; wherein the inlet includes a plurality of air nozzles having a corresponding orientation arranged next to each other in a row; wherein each air nozzle has a portion extending beyond the wall; wherein the combustion chamber has a cylindrical configuration and the air nozzles are arranged on a circle that is arranged concentric to combustion chamber; wherein the combustion chamber is designed as a circular ring; wherein the circulating gas stream flow has only a single turbulence center at the center of A; wherein the turbulence center lies on a curved surface (the bottom right hand corner near A, 146); wherein the combustion chamber includes a preheating device (the air coming into the combustor is preheated); a gas turbine comprising: a compressor; a turbine; and a combustion chamber for flameless oxidation of fuel, the combustion chamber enclosing an internal space and having an inlet connected to the compressor, an outlet that is connected to the turbine and a fuel feed device, the inlet defining an air inlet direction and the fuel feed device defining a fuel

introduction direction; wherein the fuel introduction direction and the air inlet direction are in substantially the same direction.

7. Claims 15, 17-22, 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0698764. EP '764 teaches a combustion chamber (see e.g. Figs. 1, 4) for a gas turbine comprising: a wall enclosing an internal space for serving as a reaction space; an inlet 10 or 96 leading into the internal space that is supplied with fresh air; an outlet 40 or 106 emerging from the internal space for discharging hot exhaust gases; the inlet and the outlet being aligned and the internal space configured such that a relatively large circulating gas stream flow is formed in the internal space so as to maintain a flameless oxidation process; and a fuel feed device 10 or 96 arranged to guide fuel into the internal space in a predetermined direction, the fuel feed device and the inlet having essentially the same orientation; wherein the cross sectional configurations of the inlet and outlet the geometry of the internal space are designed such that the gas stream circulating in the internal space has a mass flow rate is larger than twice a mass flow rate of the fresh air introduced into the inlet (e.g. 5:1, col. 1, line 17); wherein the inlet includes a plurality of air nozzles 96 having a corresponding orientation arranged next to each other in a row; wherein each air nozzle has a portion extending beyond the wall; wherein the combustion chamber has a cylindrical configuration and the air nozzles are arranged on a circle/ring that is arranged concentric to combustion chamber; wherein the combustion chamber is designed as a circular ring; wherein the circulating gas stream flow has only a single turbulence center; wherein the turbulence center lies on a curved surface e.g. 30; wherein

the combustion chamber includes a preheating device 42 or 46; wherein a guide device 12 or 94 is arranged in the internal space that divides the internal space into a mixing and reaction channel and a backflow channel.

8. Claims 15, 22-25, 27, 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Kydd (3,309,866). Kydd teaches a combustion chamber for a gas turbine comprising: a wall enclosing an internal space for serving as a reaction space; an inlet 32 leading into the internal space that is supplied with fresh air; an outlet emerging from the internal space for discharging hot exhaust gases; the inlet and the outlet being aligned and the internal space configured such that a relatively large circulating gas stream flow is formed in the internal space so as to maintain a flameless oxidation process (col. 1, lines 53+); and a fuel feed device (see Fig. 2) arranged to guide fuel into the internal space in a predetermined direction, the fuel feed device and the inlet having essentially the same orientation; wherein the cross sectional configurations of the inlet and outlet the geometry of the internal space are designed such that the gas stream circulating in the internal space has a mass flow rate is larger than twice a mass flow rate of the fresh air introduced into the inlet; wherein the combustion chamber is designed as a circular ring; wherein the inlet and the outlet are arranged and the geometry of the internal space is configured such that the circulating gas stream flow encompasses the entire internal space (see Fig. 3); wherein the circulating gas stream flow has only a single turbulence center; wherein the combustion chamber includes a preheating device; wherein a guide device 36 is arranged

in the internal space that divides the internal space into a mixing and reaction channel and a backflow channel

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above prior art in view of Wunning (5,154,599), The above prior art does not teach the gas stream circulating in the internal space has a mass flow rate is less than twice nor do all the reference teach more than twice a mass flow rate of the fresh air. As applicant has claimed both above and below twice, it is clear that the prior art must meet one of these conditions. Alternately, Wunning teaches using the gas stream circulating in the internal space has a mass flow rate is preferably $\geq 2$ the mass flow rate of the fresh air. Hence, it would have been obvious to one of ordinary skill in the art to employ such a ratio to ensure adequate low temperatures to prevent a flame. Alternately, Wunning's ratio of $\geq 2$, would teach one of ordinary skill in the art to use a range of just under 2 as being proximate the range taught and it would have been obvious to employ a range of just under 2 as being obvious to those of ordinary skill in the art.

11. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of Domschke et al (6,234,092), Wunning (5,154,599) and EP 0698764 in view of either Kydd (3,309,866) or WO 01/11215. The above references teach various aspects of the claimed invention including a flameless oxidation process but do not specifically teach a gas turbine engine including a compressor and turbine. Kydd and WO '215 are cited to show that it is old and well known in the combustor art to employ flameless oxidation to gas turbine combustors with a compressor and turbine. It would have been obvious to one of ordinary skill in the art to employ the combustors of the prior art with gas turbine systems, in order to reduce the emissions thereof.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone

number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm


| | | |
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